

# Student Design Challenges in Capillary Flow

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In 2016, NASA Glenn hosted two major Student Design Challenges in Capillary Flow: CELERE and CFC.

## Capillary Effects on Liquids Exploratory Research Experiments (CELERE)

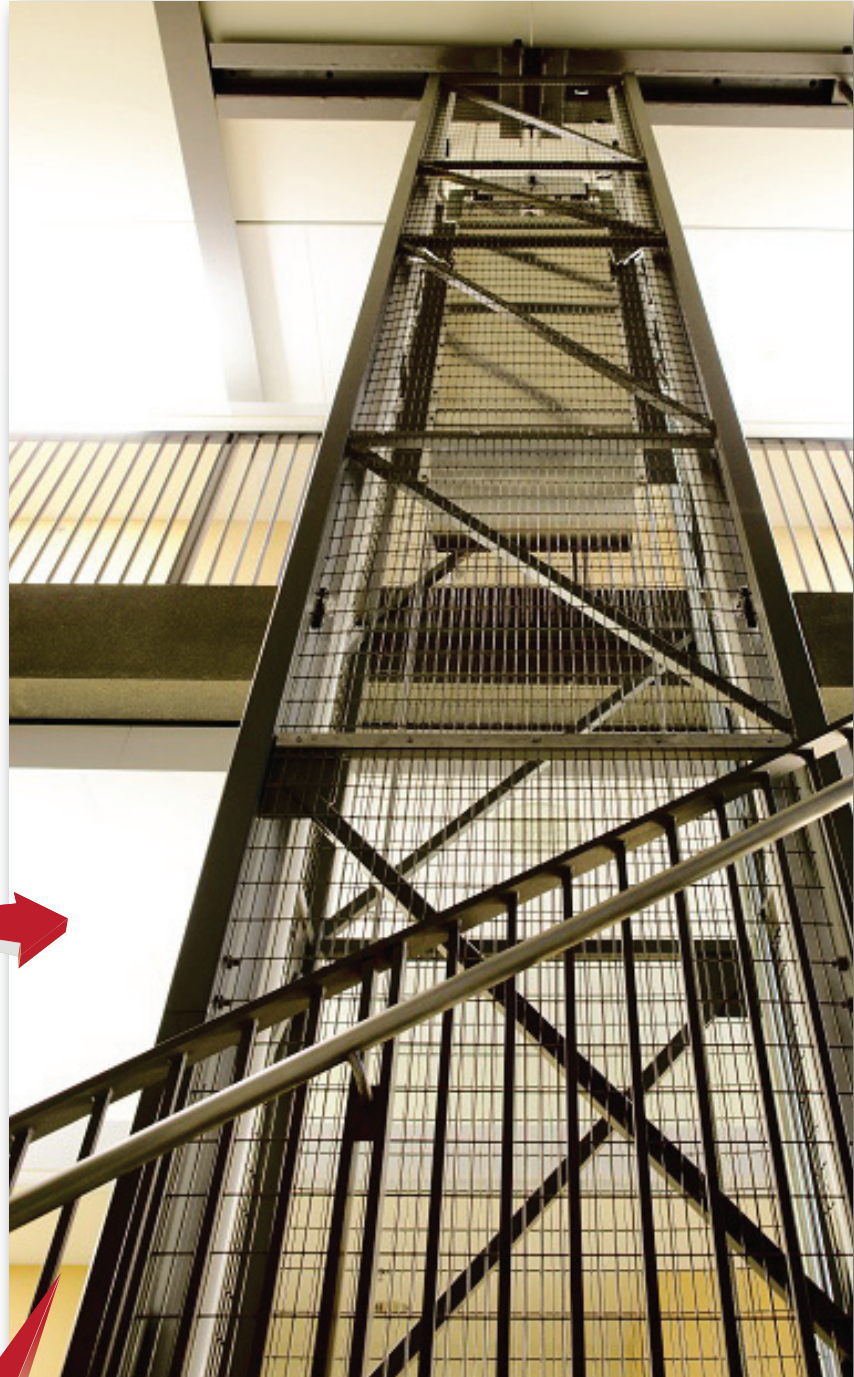
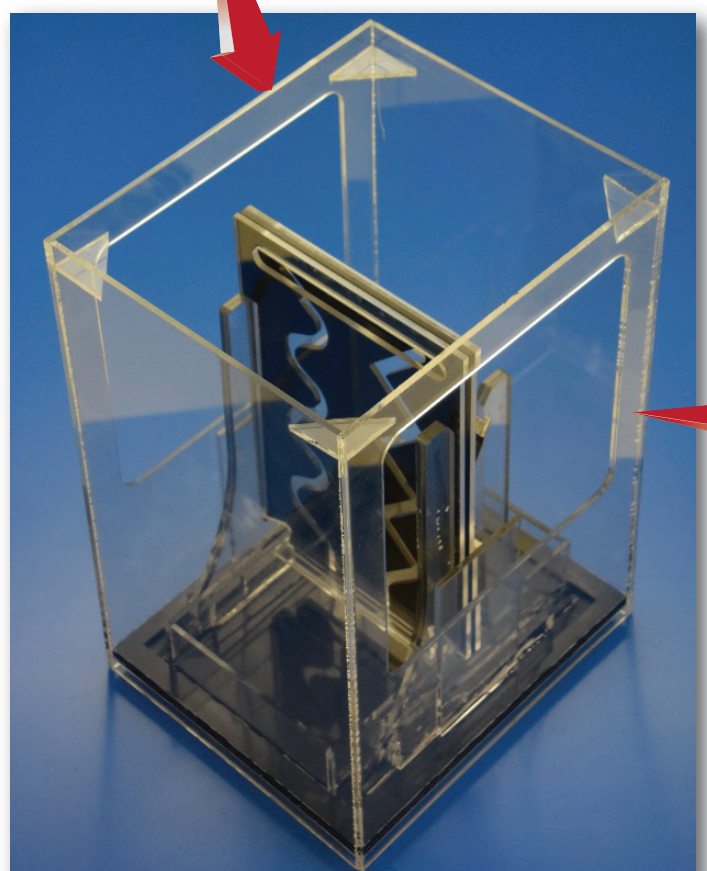
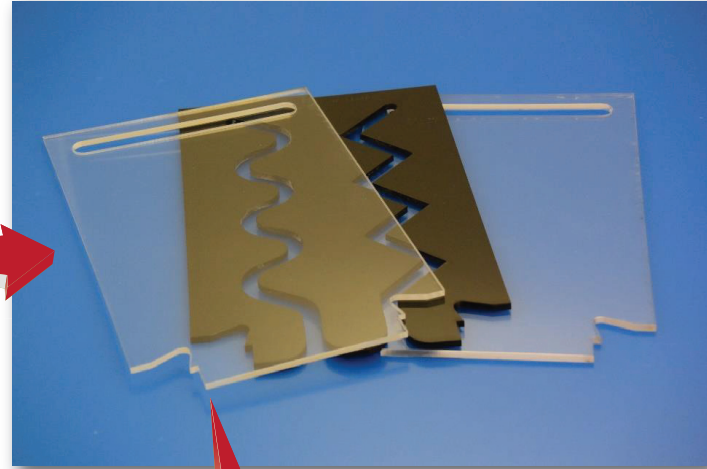
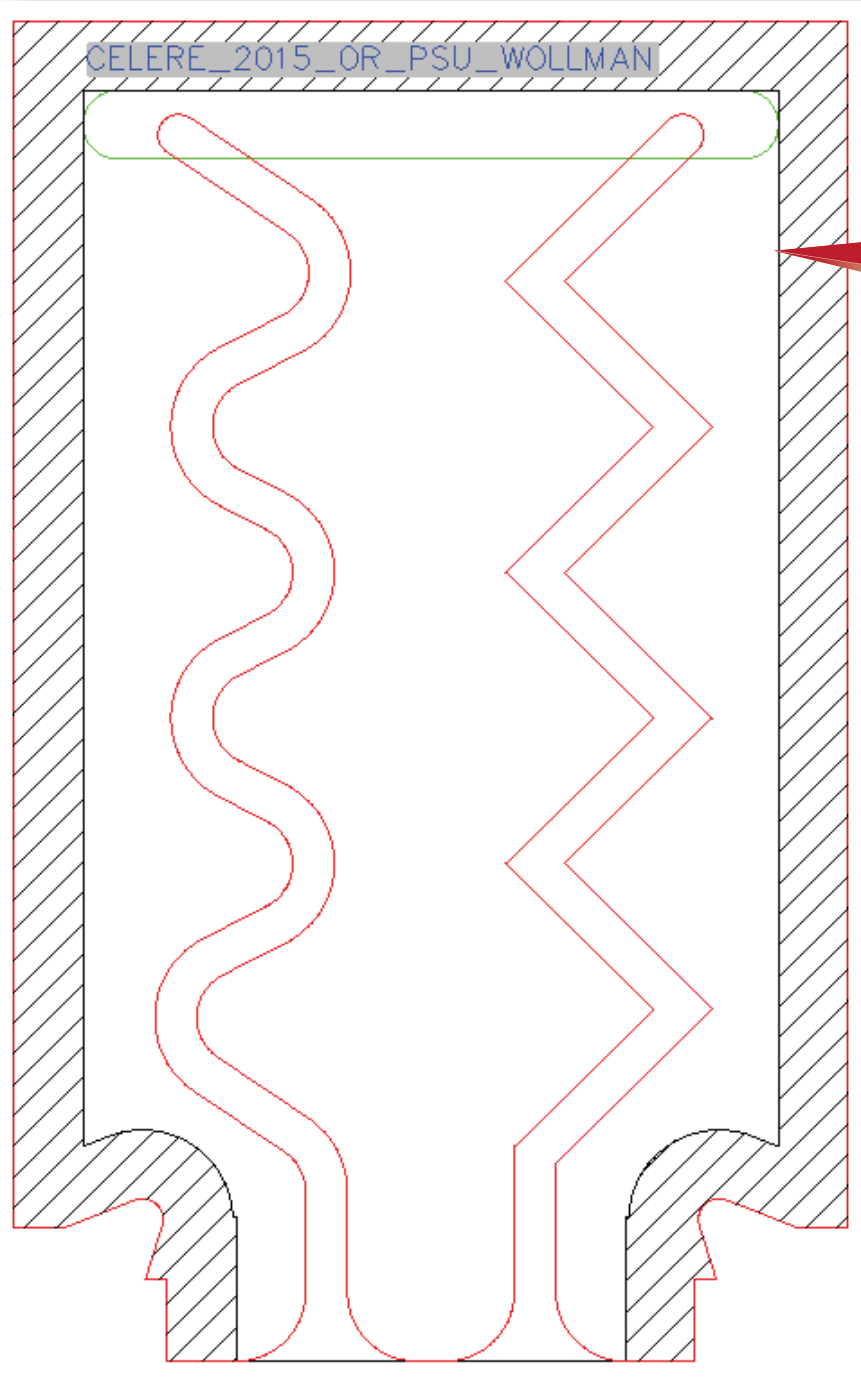
- An annual joint program of NASA and Portland State University (PSU) enabling youth to participate in microgravity research on capillary action like that conducted on the International Space Station (ISS).
- Youth design their own experiments using Computer-Aided Design (CAD) and submit them to NASA.
- Test cells are fabricated using the submitted drawing and a computer-controlled laser cutter.
- Experiments are conducted in microgravity via PSU's 2.1-Second Dryden Drop Tower.
- Results are provided online for student analysis and reporting, for example, as an extra credit or science fair project.



Sunita Williams conducting the CFE on the ISS.

## Capillary Flow Challenge (CFC)

- A one-time design challenge sponsored by the American Society for Gravitational and Space Research (ASGSR) and NASA Glenn.
- Teams of students from grades 9 to 12 design and build a simple device using capillary flow (only) to eject droplets as far as possible as the device falls down NASA's 2.2-Second Drop Tower.
- Results are provided online for student analysis and reporting.
- Student teams encouraged to present their results to microgravity researchers at the ASGSR conference in Cleveland, OH, on Saturday, October 29, 2016.

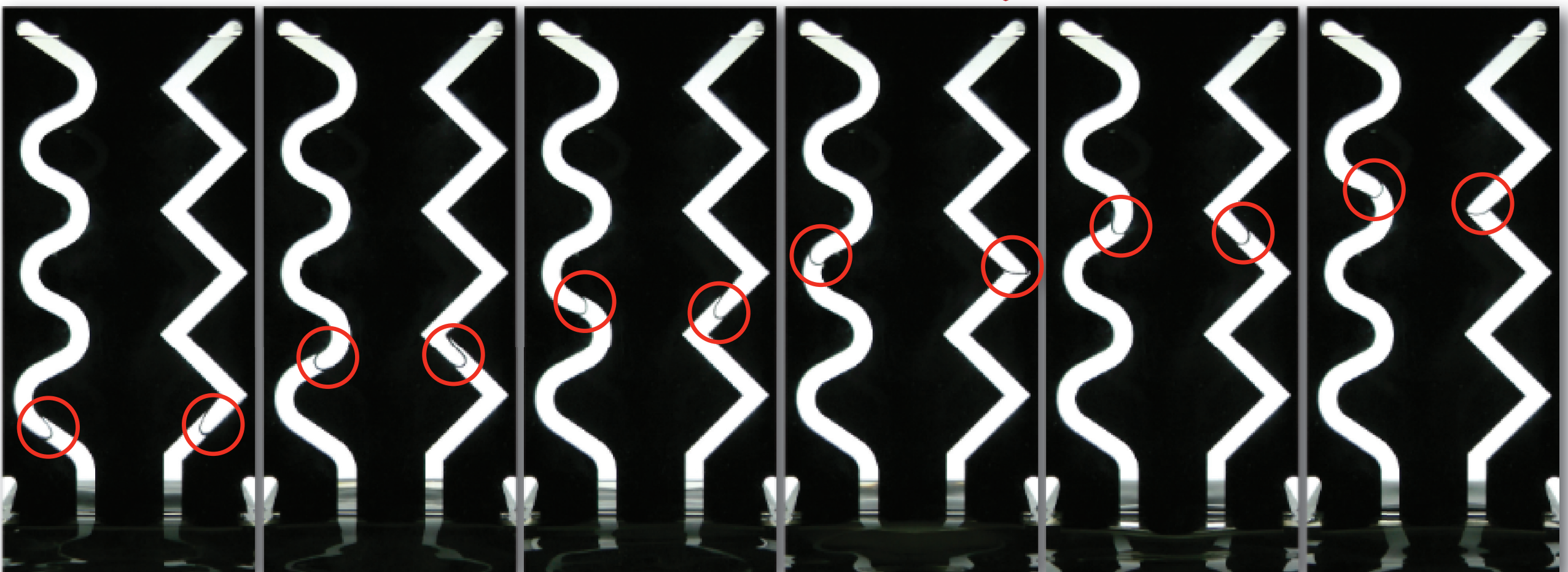


## Overall Goals

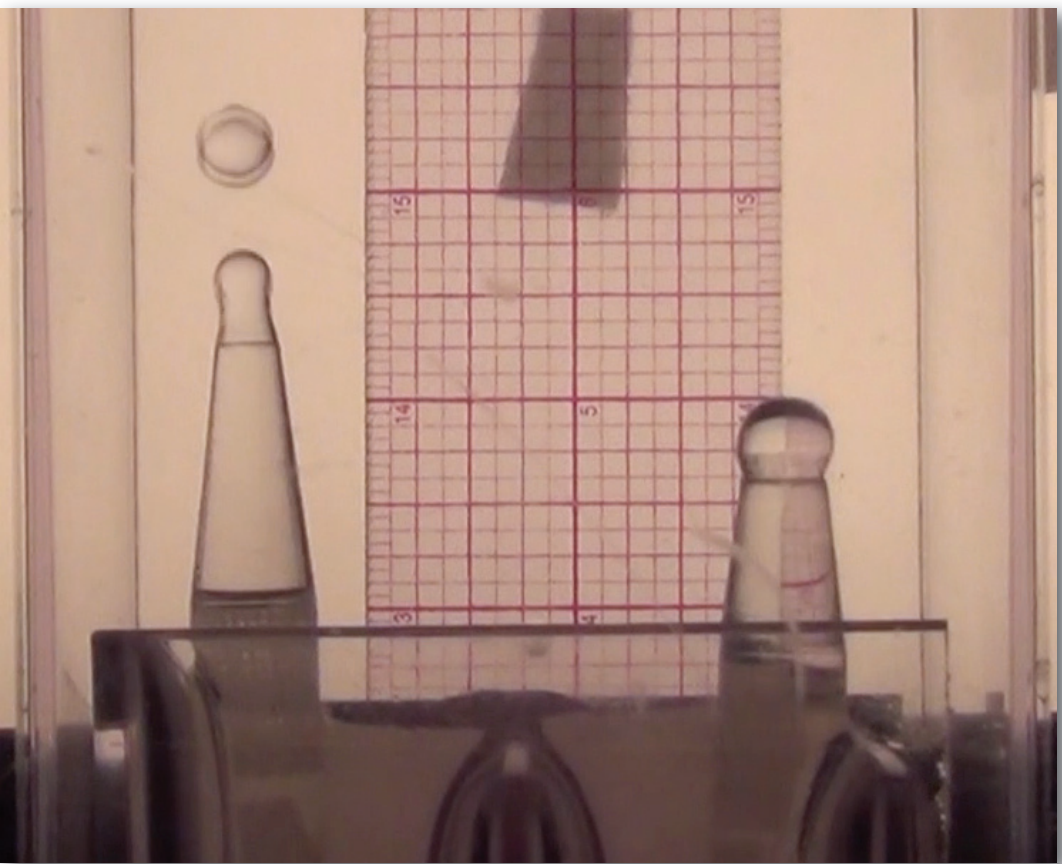
- To learn about CAD and space station science
- To learn about capillary flow
- To inspire careers in Science, Technology, Engineerings, Arts, and Mathematics (STEAM)
- To enhance college applications

## Learn More

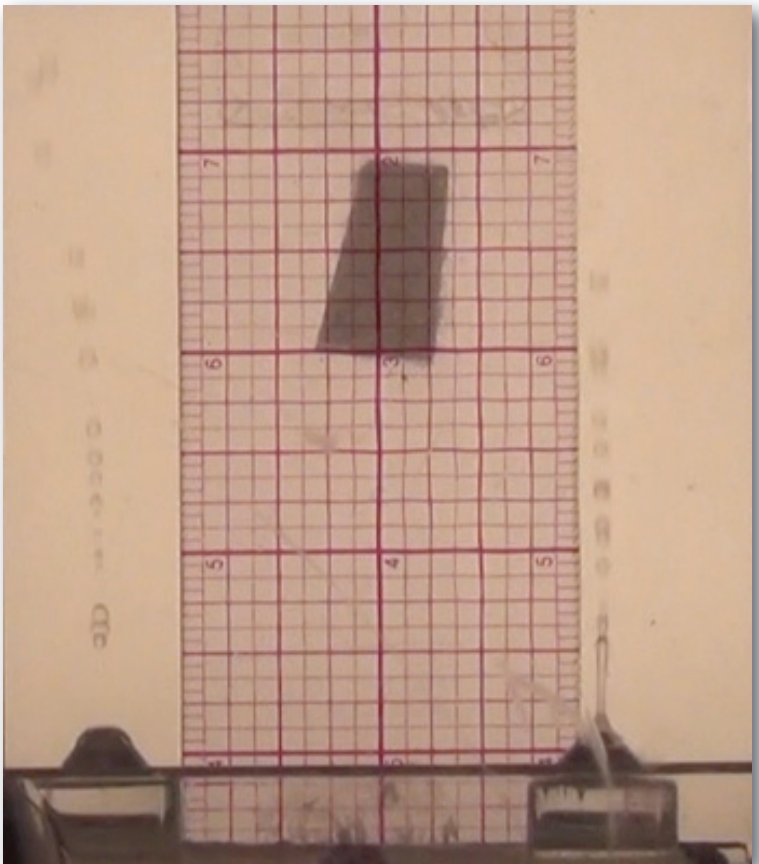
Visit <http://spaceflight systems.grc.nasa.gov/CELERE>  
or e-mail [celere@lists.nasa.gov](mailto:celere@lists.nasa.gov).



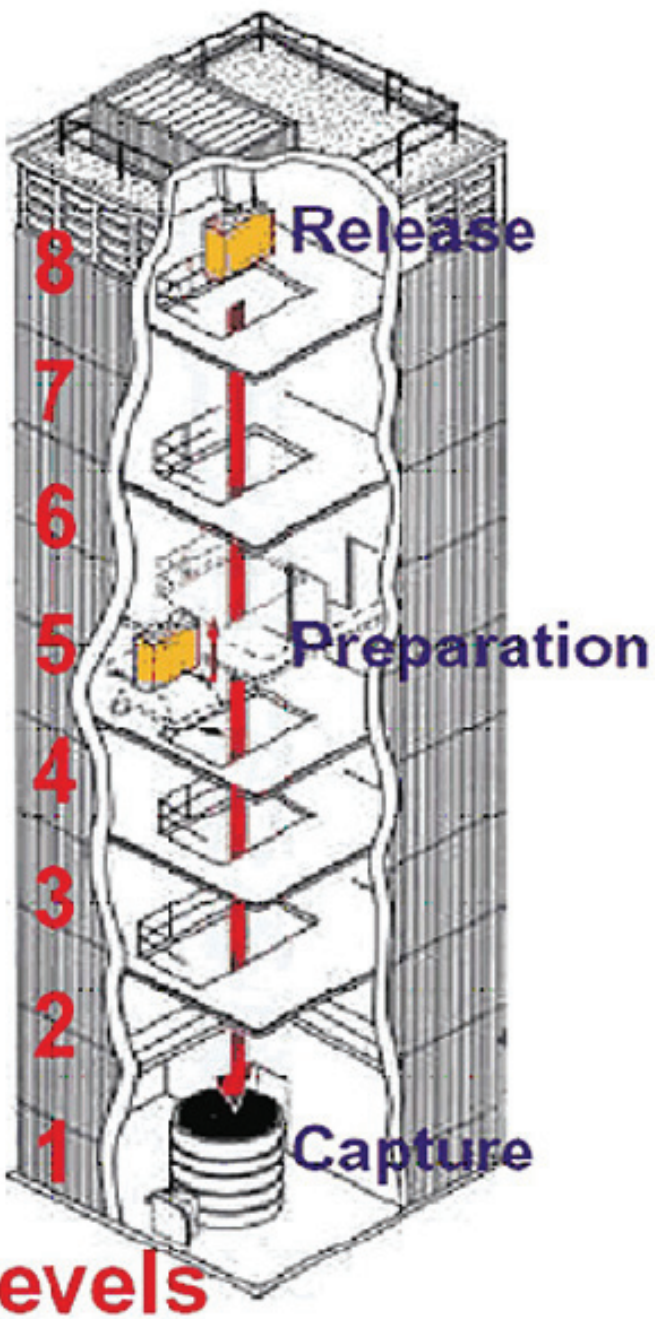
Staff preparing an experiment in view looking down the shaft of the drop tower.



Droplet ejected by capillary flow from the left-hand tube in microgravity.



Multiple droplets ejected by capillary flow in microgravity.



Floor layout of NASA Glenn's 2.2-Second Drop Tower.

The authors would like to acknowledge John McQuillen and the 2.2-Second Drop Tower Staff at NASA Glenn for their support during the CFC drop tower activities.